Contents

Volume 25 Number 1 **January**

C. H. Turner — 1 — **On Wolff's law of trabecular architecture**

M. Mauch, J. D. Currey and A. J. Sedman — 11 — **Creep fracture in bones with different stiffnesses**

J. Cholewicki and S. M. McGill — 17 — **Lumbar posterior ligament involvement during extremely heavy lifts estimated from fluoroscopic measurements**

P. Blanpied and G. L. Smidt — 29 — **Human plantarflexor stiffness to multiple single-stretch trials**

P. Ruby, M. L. Hull and D. Hawkins — 41 — **Three-dimensional knee joint loading during seated cycling**

P. Boesiger, S. E. Maier, Liu Kecheng, M. B. Scheidegger and D. Meier — 55 — **Visualization and quantification of the human blood flow by magnetic resonance imaging**

T. P. Hedman — 69 — **A new transducer for facet force measurement in the lumbar spine: benchmark and *in vitro* test results**

D. A. Loch, Zongping Luo, J. L. Lewis and N. J. Stewart — 81 — **A theoretical model of the knee and ACL: theory and experimental verification**

G. A. Johnson, H. S. Borovetz and J. L. Anderson — 91 — **A model of pulsatile flow in a uniform deformable vessel**

I. Vesely and R. Noseworthy — 101 — **Micromechanics of the fibrosa and the ventricularis in aortic valve leaflets**

Technical Note

J. F. Chapuis and P. Agache — 115 — **A new technique to study the mechanical properties of collagen lattices**

Software Survey Section — I

Volume 25 Number 2 **February**

Y. Brenière and G. Dietrich 121 **Heel-off perturbation during gait initiation: biomechanical analysis using triaxial accelerometry and a force plate**

F. C. T. Van der Helm, H. E. J. Veeger, G. M. Pronk, L. H. V. Van der Woude and R. H. Rozendal 129 **Geometry parameters for musculoskeletal modelling of the shoulder system**

K. Schneider and R. F. Zernicke 145 **Mass, center of mass, and moment of inertia estimates for infant limb segments**

B. Buchholz and T. J. Armstrong 149 **A kinematic model of the human hand to evaluate its prehensile capabilities**

R. C. Haut, R. L. Lancaster and C. E. DeCamp 163 **Mechanical properties of the canine patellar tendon: some correlations with age and the content of collagen**

J. H. Koolstra and T. M. G. J. van Eijden 175 **Application and validation of a three-dimensional mathematical model of the human masticatory system *in vivo***

D. Karlsson and B. Peterson 189 **Towards a model for force predictions in the human shoulder**

Technical Note

C. W. Spoor and J. L. van Leeuwen 201 **Knee muscle moment arms from MRI and from tendon travel**

Letters to the Editor

J. L. van Leeuwen and C. W. Spoor 207 **On the role of biarticular muscles in human jumping**

F. E. Zajac and M. G. Pandy 208 **Authors' response**

Book Review

G. A. Johnson, D. A. Vorp and H. S. Borovetz 211 ***Biofluid Mechanics—Blood Flow in Larger Vessels***

Software Survey Section I

Volume 25 Number 3 **March**

M. Lei, A. A. van Steenhoven and D. H. van Campen — 213 **Experimental and numerical analyses of the steady flow field around an aortic Björk–Shiley standard valve prosthesis**

M. F. Bobbert, M. R. Yeadon and B. M. Nigg — 223 **Mechanical analysis of the landing phase in heel–toe running**

S. Kornecki — 235 **Mechanism of muscular stabilization process in joints**

J. S. Hou, V. C. Mow, W. M. Lai and M. H. Holmes — 247 **An analysis of the squeeze-film lubrication mechanism for articular cartilage**

R. T. Hart, V. V. Hennebel, N. Thongpreda, W. C. Van Buskirk and R. C. Anderson — 261 **Modeling the biomechanics of the mandible: a three-dimensional finite element study**

Y. C. Pao, J. T. Lu and E. L. Ritman — 287 **Bending and twisting of an *in vivo* coronary artery at a bifurcation**

S. F. C. Stewart and D. J. Lyman — 297 **Effects of a vascular graft/natural artery compliance mismatch on pulsatile flow**

S. V. Kolmogorov and O. A. Duplishcheva — 311 **Active drag, useful mechanical power output and hydrodynamic force coefficient in different swimming strokes at maximal velocity**

K. B. Sahay, R. Mehrotra, U. Sachdeva and A. K. Banerji — 319 **Elastomechanical characterization of brain tissues**

Announcement — 327 **The Science and Technology of Orthopaedic Implants**

Volume 25 Number 4 **April**

J. L. Gilbert, R. S. Bloomfeld, E. P. Lautenschlager and R. L. Wixson — 329 **A computer-based biomechanical analysis of the three-dimensional motion of cementless hip prostheses**

D. Zinemanas and A. Nir — 341 **A fluid-mechanical model of deformation during embryo exogastrulation**

M. A. Lafortune, P. R. Cavanagh, H. J. Sommer III and A. Kalenak — 347 **Three-dimensional kinematics of the human knee during walking**

F. Linde, I. Hvid and F. Madsen 359 **The effect of specimen geometry on the mechanical behaviour of trabecular bone specimens**

H. H. C. M. Savelberg, J. G. M. Kooloos, R. Huiskes and J. M. G. Kauer 369 **Stiffness of the ligaments of the human wrist joint**

S. L-Y. Woo, P. O. Newton, D. A. MacKenna and R. M. Lyon 377 **A comparative evaluation of the mechanical properties of the rabbit medial collateral and anterior cruciate ligaments**

K. Firoozbakhsh, M. Aleyaasin and M. S. Moneim 387 **Evolution of bone inhomogeneity around a hole in an orthotropic plate of bone: theoretical predictions**

S. M. McGill 395 **A myoelectrically based dynamic three-dimensional model to predict loads on lumbar spine tissues during lateral bending**

J. S. Bensusan, D. T. Davy, V. M. Goldberg, J. W. Shaffer, S. Stevenson, L. Klein and G. Field 415 **The effects of vascularity and cyclosporin A on the mechanical properties of canine fibular autografts**

R. L. Lieber, C. G. Brown and C. L. Trestik 421 **Model of muscle–tendon interaction during frog semitendinosis fixed-end contractions**

H. Nygaard, M. Giersiepen, J. M. Hasenkam, H. Reul, P. K. Paulsen, P. E. Rovsing and D. Westphal 429 **Two-dimensional color-mapping of turbulent shear stress distribution downstream of two aortic bioprosthetic valves *in vitro***

I. D. McCarthy and L. Yang 441 **A distributed model of exchange processes within the osteon**

Technical Notes

A. M. Kaigle, M. H. Pope, B. C. Fleming and T. Hansson 451 **A method for the intravital measurement of interspinous kinematics**

T. David, J. Clamp and J. Fisher 457 **Analysis of regurgitant jets in natural and bio-prosthetic heart valves**

Books Received 463

Announcement 465 **3rd Conference of the International Society for Fracture Repair (ISFR-92)**

Erratum 467

W. M. Mihalko, A. J. Beaudoin, J. A. Cardea and W. R. Krause 469 **Finite-element modelling of femoral shaft fracture fixation techniques post total hip arthroplasty**

T. P. Harrigan and J. J. Hamilton 477 **An analytical and numerical study of the stability of bone remodelling theories: dependence on microstructural stimulus**

S. J. Simske, K. M. Guerra, A. R. Greenberg and M. W. Luttges 489 **The physical and mechanical effects of suspension-induced osteopenia on mouse long bones**

P. Li and Z. Ladin 501 **Mathematical modelling of the effect of sole elasticity distribution on pronation**

D. L. Butler, Y. Guan, M. D. Kay, J. F. Cummings, S. M. Feder and M. S. Levy 511 **Location-dependent variations in the material properties of the anterior cruciate ligament**

A. B. Schultz 519 **Mobility impairment in the elderly: challenges for biomechanics research**

R. F. Closkey, A. B. Schultz and C. W. Luchies 529 **A model for studies of the deformable rib cage**

J. D. Humphrey, R. L. Barazotto Jr and W. C. Hunter 541 **Finite extension and torsion of papillary muscles: a theoretical framework**

H. A. Hogan 549 **Micromechanics modeling of Haversian cortical bone properties**

Technical Note

R. L. Lieber and C. G. Brown 557 **Quantitative method for comparison of skeletal muscle architectural properties**

Announcement 561 **XIVth International Society of Biomechanics Congress**

Erratum 563

J. J. de Koning, G. de Groot and G. J. van Ingen Schenau 565 **Ice friction during speed skating**

J. J. de Koning, G. de Groot and G. J. van Ingen Schenau 573 **A power equation for the sprint in speed skating**

K. Isaaz 581 **A theoretical model for the non-invasive assessment of the trans-mitral pressure–flow relation**

G. A. Ateshian, M. P. Rosenwasser and V. C. Mow 591 **Curvature characteristics and congruence of the thumb carpometacarpal joint: differences between female and male joints**

T. P. Quinn and C. D. Mote Jr 609 **Prediction of the loading along the leg during snow skiing**

Technical Notes

M. Manouel, H. S. Pearlman, Abdelfatihe Belakhlef and T. D. Brown 627 **A miniature piezoelectric polymer transducer for *in vitro* measurement of the dynamic contact stress distribution**

T. J. Koh, M. D. Grabiner and R. J. De Swart 637 ***In vivo* tracking of the human patella**

Xiang-Dong Guo and S. C. Cowin 645 **Periosteal and endosteal control of bone remodeling under torsional loading**

Abstracts 651 **Abstracts of the Fifteenth Annual Meeting of the American Society of Biomechanics**

Letters to the Editor

Narayan Yoganandan and F. A. Pintar 689 **Comment on "Variations of stiffness and strength along the human cervical spine"**

M. Shea, W. T. Edwards, A. A. White and W. C. Hayes 690 **Authors' response**

Volume 25 Number 7 **July**

ABSTRACTS OF THE XIII CONGRESS, INTERNATIONAL SOCIETY OF BIOMECHANICS

Abstracts 691 **XIII Congress, International Society of Biomechanics**

Author Index to Abstracts i

Volume 25 Number 8 **August**

U. Bosch, B. Decker, W. Kasperczyk, A. Nerlich, H.-J. Oestern and H. Tscherne 821 **The relationship of mechanical properties to morphology in patellar tendon autografts after posterior cruciate ligament replacement in sheep**

D. Chimich, N. Shrive, C. Frank, L. Marchuk and R. Bray 831 **Water content alters viscoelastic behaviour of the normal adolescent rabbit medial collateral ligament**

S. D. Smith 839 **Impedance response characteristics of the primate *Mucaca mulatta* exposed to seated whole-body g_z vibration**

F.L.I.P. Drijber, J. B. Finlay and A. J. Dempsey 849 **Evaluation of linear finite-element analysis models' assumptions for external fixation devices**

R. Raikova 857 **A general approach for modelling and mathematical investigation of the human upper limb**

R. M. V. Pidaparti and D. B. Burr 869 **Collagen fiber orientation and geometry effects on the mechanical properties of secondary osteons**

B. Khosravi-Sichani, H. Hemami and S. Yurkovich 881 **Energy transformations in human movement by contact**

D. Gagnon and M. Gagnon 891 **The influence of dynamic factors on triaxial net muscular moments at the L5/S1 joint during asymmetrical lifting and lowering**

H. Gareis, M. Solomonow, R. Baratta, R. Best and R. D'Ambrosia 903 **The isometric length–force models of nine different skeletal muscles**

S. S. Margulies and L. E. Thibault 917 **A proposed tolerance criterion for diffuse axonal injury in man**

Technical Notes

Maw-Chang Lee and R. C. Haut — 925 — **Strain rate effects on tensile failure properties of the common carotid artery and jugular veins of ferrets**

X. Y. Luo and Z. B. Kuang — 929 — **A study on the constitutive equation of blood**

E. M. Pedersen, A. P. Yoganathan and X. P. Lefebvre — 935 — **Pulsatile flow visualization in a model of the human abdominal aorta and aortic bifurcation**

W. Herzog, S. Kamal and H. D. Clarke — 945 — **Myofilament lengths of cat skeletal muscle: theoretical considerations and functional implications**

Book Review

R. A. Brand — 949 — ***The Biomechanics and Motor Control of Human Gait: Normal, Elderly, and Pathological***

Books Received — 950

Announcement — 951 — **Application of Basic Sciences in Orthopedics**

Volume 25 Number 9 — **September**

R. Jacobs and G. J. van Ingen Schenau — 953 — **Intermuscular coordination in a sprint push-off**

J. W. Osborn and F. A. Baragar — 967 — **Predicted and observed shapes of human mandibular condyles**

R. D. Milne and J. P. Davis — 975 — **The role of the shaft in the golf swing**

W. A. Mandarino, S. A. Berceli, R. A. Sheppeck and H. S. Borovetz — 985 — **Experimental determination of velocity profiles and wall shear rate along the rabbit aortoiliac bifurcation: relationship to vessel wall low-density lipoprotein (LDL) metabolism**

J. A. Juan, J. Prat, P. Vera, J. V. Hoyos, J. Sánchez-Lacuesta, J. L. Peris, R. Dejoz and R. Alepuz — 995 — **Biomechanical consequences of callus development in Hoffmann, Wagner, Orthofix and Ilizarov external fixators**

R. C. Wagenaar and W. J. Beek — 1007 — **Hemiplegic gait: a kinematic analysis using walking speed as a basis**

C. J. Zuurbier and P. A. Huijing — 1017 — **Influence of muscle geometry on shortening speed of fibre, aponeurosis and muscle**

R. L. Spilker, P. S. Donzelli and V. C. Mow — 1027 — **A transversely isotropic biphasic finite element model of the meniscus**

Technical Notes

N. F. MacLean, R. G. Kratky, T. W. R. Macfarlane and M. R. Roach — 1047 — **Taper: an important feature of Y-bifurcations in porcine renal arteries and human cerebral arteries**

J. H. Challis and D. G. Kerwin — 1053 — **Accuracy assessment and control point configuration when using the DLT for photogrammetry**

P. S. Walker and S. Sathasivam — 1059 — **A simplified radiographic method for measuring bone–component motion in total knees**

A. A. Caputi, J. A. Hoffer and I. E. Pose — 1067 — **Velocity of ultrasound in active and passive cat medial gastrocnemius muscle**

Ning Lan and P. E. Crago — 1075 — **A noninvasive technique for *in vivo* measurement of joint torques of biarticular muscles**

T. S. Gross, K. J. McLeod and C. T. Rubin — 1081 — **Characterizing bone strain distributions *in vivo* using three triple rosette strain gages**

M. P. de Looze, J. B. J. Bussmann, I. Kingma and H. M. Toussaint — 1089 — **Different methods to estimate total power and its components during lifting**

Letters to the Editor

J. C. Barbenel — 1097 — **Comments on 'A three-dimensional analysis of a bioprosthetic heart valve'**

M. M. Black, I. C. Howard, X. Huang and E. A. Patterson — 1097 — **Authors' response**

Book Review

R. A. Brand — 1099 — ***Concise Encyclopedia of Biological and Biomedical Measurement Systems***

Books Received — 1101

Announcement — 1103 — **6th National Conference on Biomaterials and Artificial Organs**

L. Coquart, C. Depeursinge, A. Curnier and R. Ohayon 1105 **A fluid–structure interaction problem in biomechanics: prestressed vibrations of the eye by the finite element method**

T. Arts, W. C. Hunter, A. Douglas, A. M. M. Muijtjens and R. S. Reneman 1119 **Description of the deformation of the left ventricle by a kinematic model**

P. H. M. Bovendeerd, T. Arts, J. M. Huyghe, D. H. van Campen and R. S. Reneman 1129 **Dependence of local left ventricular wall mechanics on myocardial fiber orientation: a model study**

Cheng Tu, M. Deville, L. Dheur and L. Vanderschuren 1141 **Finite element simulation of pulsatile flow through arterial stenosis**

F. Lavaste, W. Skalli, S. Robin, R. Roy-Camille and C. Mazel 1153 **Three-dimensional geometrical and mechanical modelling of the lumbar spine**

T. R. Oxland and M. M. Panjabi 1165 **The onset and progression of spinal injury: a demonstration of neutral zone sensitivity**

R. M. Herring and A. E. Chapman 1173 **Effects of changes in segmental values and timing of both torque and torque reversal in simulated throws**

P. Neumann, T. S. Keller, L. Ekström, L. Perry, T. H. Hansson and D. M. Spengler 1185 **Mechanical properties of the human lumbar anterior longitudinal ligament**

P. Ruby, M. L. Hull, K. A. Kirby and D. W. Jenkins 1195 **The effect of lower-limb anatomy on knee loads during seated cycling**

Technical Notes

A. L. Hof 1209 **An explicit expression for the moment in multibody systems**

M. Mridha, S. Ödman and P. Å. Öberg 1213 **Mechanical pulse wave propagation in gel, normal and oedematous tissues**

A. J. van Soest, A. L. Schwab, M. F. Bobbert and G. J. van Ingen Schenau 1219 **SPACAR: a software subroutine package for simulation of the behavior of biomechanical systems**

T. C. Lam, C. B. Frank and N. G. Shrive — 1227 — **Calibration characteristics of a video dimension analyser (VDA) system**

R. J. Jaeger and P. Vanitchatchavan — 1233 — **Ground reaction forces during termination of human gait**

P. E. Martin and A. P. Marsh — 1237 — **Step length and frequency effects on ground reaction forces during walking**

M. P. Akhter, D. M. Raab, C. H. Turner, D. B. Kimmel and R. R. Recker — 1241 — **Characterization of *in vivo* strain in the rat tibia during external application of a four-point bending load**

Letters to the Editor

M. R. Yeadon — 1247 — **Comments on 'Thoracic injury potential of basic competition taekwondo kicks'**

D. K. Lieu — 1247 — **Author's response**

Book Review

S. A. Wainwright — 1249 — ***Biomechanics in Evolution***

Corrigendum

R. B. Martin — 1251 — **Determinants of the mechanical properties of bones**

Instructions to Contributors — I

Volume 25 Number 11 — **November**

J. N. A. L. Leijnse, J. E. Bonte, J. M. F. Landsmeer, J. J. Kalker, J. C. Van Der Meulen and C. J. Snijders — 1253 — **Biomechanics of the finger with anatomical restrictions—the significance for the exercising hand of the musician**

T. N. Gardner, J. C. Elliott, Z. Sklar and G. A. D. Briggs — 1265 — **Acoustic microscope study of the elastic properties of fluorapatite and hydroxyapatite, tooth enamel and bone**

H. M. Toussaint, C. E. van Baar, P. P. van Langen, M. P. de Looze and J. H. van Dieën — 1279 — **Coordination of the leg muscles in backlift and leglift**

P. R. van Weeren, M. O. Jansen, A. J. van den Bogert and A. Barneveld — 1291 — **A kinematic and strain gauge study of the reciprocal apparatus in the equine hind limb**

Mair Zamir, P. Sinclair and T. H. Wonnacott — 1303 — **Relation between diameter and flow in major branches of the arch of the aorta**

H. D. Wagner and S. Weiner	1311	**On the relationship between the microstructure of bone and its mechanical stiffness**
K. Ookawa, M. Sato and N. Ohshima	1321	**Changes in the microstructure of cultured porcine aortic endothelial cells in the early stage after applying a fluid-imposed shear stress**
W. Herzog, T. R. Leonard, J. M. Renaud, J. Wallace, G. Chaki and S. Bornemisza	1329	**Force–length properties and functional demands of cat gastrocnemius, soleus and plantaris muscles**
E. Belardinelli and S. Cavalcanti	1337	**Theoretical analysis of pressure pulse propagation in arterial vessels**
Technical Notes		
F. A. Pintar, N. Yoganandan, T. Myers, A. Elhagediab and A. Sances	1351	**Biomechanical properties of human lumbar spine ligaments**
B. Drerup and E. Hierholzer	1357	**Evaluation of frontal radiographs of scoliotic spines—Part I. Measurement of position and orientation of vertebrae and assessment of clinical shape parameters**
J. L. Mercer and K. Robotham	1363	**A comparison between the inlet and outlet diameters of the normal aortic valve**
Letter to the Editor		
T. van den Bogert, K. Gielo-Perczak and H. J. Woltring	1367	**Biomch-L: An electronic mail discussion forum for biomechanics and movement science**
Announcement	1369	**Second International Symposium on 3-D Analysis of Human Movement**

Volume 25 Number 12 **December**

K. Choi and S. A. Goldstein	1371	**A comparison of the fatigue behavior of human trabecular and cortical bone tissue**
A. B. Schultz, N. B. Alexander and J. A. Ashton-Miller	1383	**Biomechanical analyses of rising from a chair**
S. Hirokawa	1393	**Effects of variation on extensor elements and operative procedures in patellofemoral disorders**

R. S. Candadai and N. P. Reddy — 1403 — **Stress distribution in a physical buttock model: effect of simulated bone geometry**

R. L. Rakotomanana, P. F. Leyvraz, A. Curnier, J. H. Heegaard and P. J. Rubin — 1413 — **A finite element model for evaluation of tibial prosthesis–bone interface in total knee replacement**

H. Weinans, R. Huiskes and H. J. Grootenboer — 1425 — **The behavior of adaptive bone-remodeling simulation models**

B. Drerup and E. Hierholzer — 1443 — **Evaluation of frontal radiographs of scoliotic spines—Part II. Relations between lateral deviation, lateral tilt and axial rotation of vertebrae**

J. K. B. Krijger, R. M. Heethaar, B. Hillen, H. W. Hoogstraten and J. Ravensbergen — 1451 — **Computation of steady three-dimensional flow in a model of the basilar artery**

D. A. Hawkins and M. L. Hull — 1467 — **An activation–recruitment scheme for use in muscle modeling**

N. Stergiopulos, D. F. Young and T. R. Rogge — 1477 — **Computer simulation of arterial flow with applications to arterial and aortic stenoses**

Technical Note

T. L. Norman, D. Vashishth and D. B. Burr — 1489 — **Effect of groove on bone fracture toughness**

Letters to the Editors

S. C. Cowin and C. H. Turner — 1493 — **On the relationship between the orthotropic Young's moduli and fabric**

M. W. Otter and G. V. B. Cochran — 1495 — **Comments on 'Fluid movement in bone: theoretical and empirical'**

Announcement — 1497 — **The Bulgarian Society of Biomechanics**

Corrigendum

D. A. Winter — 1499 — **Book Review: The biomechanics and motor control of human gait: normal, elderly and pathological**

Volume Contents and Author Index for Volume 25 — I

Instructions to Contributors — XIX